# Vision for Information Technology
in North Dakota

Customer Focused

Efficient

Well Managed

Leadership
for Developing a
Shared Infrastructure

The field of information systems has always changed rapidly. This is especially true today when methods and technologies are constantly being improved, altered, or discovered. The pace of technological change and the rising expectations of users means even the most effective information technology organizations must continue to learn, improve and plan toward the future.

Information is both a significant resource for, and a major product of, state government. The state's ability to collect information, process it in a useful way, and share it collaboratively with all levels of government is of significant importance in conducting the business of providing citizens with faster and more efficient service. This statewide plan embraces that purpose.

Although North Dakota agencies have diversified business functions, four common planning threads emerge when viewed from a wider-ranging perspective. These general components form the nucleus of the statewide vision for information technology. Critical to the planning processes of the more than 80 state agencies contributing to this plan is the recognition of this broader statewide strategic vision.

This vision also provides decision-makers with criteria for evaluating technology projects and funding initiatives. While the vision does not provide specific spending priorities, it does provide a basis for evaluating projects. Each properly designed and assessed individual project should then move the state closer to achieving its overall vision. This statewide plan now brings the agency plans together for that purpose.

Like all technology plans, this plan is built on business requirements. These four vision threads identify the business requirements for North Dakota state government and drive technology planning efforts.

These vision statements for information technology provide the common direction for coordinated efforts. State agencies use this vision as a basis for information technology planning. By working together, goals are achieved faster and more efficiently.

# State government should be customer focused.

The creation of e-government portals on the Internet has forever transformed the way in which government customers access services.

Governments consist of agencies organized for narrow, stovepipe purposes. Users of government services, i.e. citizens, businesses, employees, and other governments, often have multiple needs and are required to seek out and visit multiple agencies, often at multiple locations, to satisfy their needs. The Internet has facilitated the formation of electronic governments, or e-governments, that act as virtual front desks for government. The creation of e-government portals on the Internet has forever transformed the way in which government customers access services.


Unfortunately, efforts so far have not been uniform. In December 1999, an executive memorandum was issued for the heads of federal departments and agencies. Directives included in the memorandum promote the identification and organization of government services in ways that make it easier for the public to electronically find the information it seeks.

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The memorandum stated that, "While Government agencies have created 'one-stop-shopping' access to information on their agency web sites, these efforts have not uniformly been as helpful as they could be to the average citizen, who first has to know which agency provides the service he or she needs. There has not been sufficient effort to provide Government information by category of information and service — rather than by agency — in a way that meets people's needs."

Wayne Hanson, Consulting Editor for *e-gov* magazine supplement, June 2000, provides reasons for the non-uniformity. He says that, "The hard realities of re-engineering, of obtaining funding and recruiting and training sufficient staff to make it work, have not yet been confronted. Fundamental questions of taxation, revenue, jurisdiction, economic development and regulation have also not been resolved or, in some cases, even fully understood."

Technological innovation and the speed of information are allowing society to do new things, and old things in new ways. As this different kind of society emerges, a different kind of government is needed, a government that uses technology as a vehicle for focusing on fast and expanded customer service.

Traditional government is based upon physical boundaries; the new electronic government, or e-gov, transcends boundaries. Rules and regulations based upon borders quickly lose their meaning within the Internet. As geography loses its significance, new models of citizenship will surface.

To address the new models, strategic investments are needed. The National Governor's Association emphasizes that the new economy calls for strategic investments, both intellectual and physical. "Human capital investments should focus on lifelong learning, providing opportunities from early childhood through adulthood for

people to gain the requisite skills for the coming decades. Physical investments should focus on the institutions and facilities needed to acquire these skills and the infrastructure needed to support businesses and improve the quality of life."

E-government questions the fundamental organization and delivery of government, creating challenges much greater than the medium associated with the delivery. Because of the Internet, all of government must adapt. Web page development and email are only a small part of the electronic government revolution. The dynamics of government are changing as a result of the Internet.

The solutions to e-government rest with elected and top-level appointed government leaders. Information technology can facilitate the electronic delivery of services and information, but it cannot, and should not, control the re-engineering required. Political scientists and sociologists must steer e-governance.

To date, early e-government initiatives in many states, North Dakota among them, have targeted the dissemination of ordinary information and the automation of existing services. For example, the state of North Dakota's new web portal, DiscoverND.com, lists the following customer-oriented electronic government options: Contractor License Inquiry, E-Forms, Harvest Inventory Program, New Business Registration, Purchase Hunting and Fishing Licenses, and Purchase Birth/Death/Marriage Certificates.

The Online Dakota Information Network (ODIN) is another significant e-government initiative operated by the University of North Dakota. ODIN provides public access to library information and research materials of its more than 40 member libraries. ODIN is a virtual library without boundaries.

North Dakota University System needs to replace its current financial, student information and human resources/payroll systems with an integrated system that will provide improved service to students, employees, policy makers and vendors. Online admission, registration and bill paying processes are becoming essential to attract and retain students. Demand and availability for distance education courses are also growing as students look at alternatives to full-time on-campus enrollment.

Because of the Internet, all of government must adapt.

Currently, electronic governance initiatives are speeding ahead. However, according to *Government Technology* magazine, June 2000, the Gartner Group, a technology research and consulting firm, states that more than half of e-government initiatives will fail in the next five years because the systems aren't up to citizen expectations. The report also says that governments have fallen behind consumers and businesses in the use of computers and the Internet.

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Actions taken by government officials indicate that North Dakota is moving in the right direction at a speed on par with the bulk of the states. However, the big winners in e-commerce are moving at a much greater speed, sweeping the expectations of consumers, a.k.a. citizens, with them. As expectations toward commerce adjust, the way citizens relate to government will transform.

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These indications imply that the state of North Dakota should:

- **Transcend stovepipes** - Adopt a philosophy of change management that transcends traditional functional stovepipes.

- **Resolve fundamental questions** - Work toward understanding and resolving fundamental questions of privacy, security, taxation, revenue, jurisdiction, economic development and regulation in relation to electronic governance.

- **Understand expectations** - Keep abreast of citizen expectations of government.

- **Track legislation** - Follow digital government legislative and gubernatorial mandates of other states for use as models, especially in such areas as privacy, security, and digital signatures.

- **Cross boundaries** - Re-engineer government, cutting across physical and organizational boundaries when required, to meet the changing expectations of citizens.

- **Elevate the "I" in IT** - Give the *information* part of information technology equal status when building the state's web portal. Include knowledge workers along side of technicians when creating a customer centric "front desk" to government. Re-organize functional work groups if necessary.

- **Deliver more e-government** - Aggressively continue to improve access to government by delivering more self-service models of government over the Internet.

- **Build intellectual and physical infrastructure** - Grow "e-society" by requiring information technology training in school curricula while nourishing rural telecommunications access at affordable rates.

- **Use IT properly** - Use information technologists to facilitate, not drive, e-government initiatives as leadership must come from the top, i.e. the state legislature and the governor, guided by the Chief Information Officer (CIO).

- **Expand distance learning offerings** - Promote the education "anywhere—anytime" concept and expand distance learning offerings.

- **Balance privacy issues** - Balance the public's need to know with the rights of individuals for privacy. Develop policy for state agencies based on best practices of notice, choice, access, and security.

The state of North Dakota web site will eventually become the "shopping mall" for state government information and services. Citizens will have opportunities to be informed and involved as never before.

In moving toward a digital state, the question of how to balance the legitimate expectations of individuals for privacy with the needs of government becomes important. Expanding the awareness of state agency managers and staff with regard to privacy and security issues becomes a challenge that must be met. Legislation at both state and national levels will need to be considered and followed closely to avoid the risk of gradual, long-term erosion of privacy.

# State government should be efficient.

While state government continuously strives to improve its effectiveness and efficiency, funding for many programs is limited. Government must constantly streamline operations and improve the quality in the delivery of diverse programs. The success of such programs is made possible through the implementation of state-of-the-art information technology. The effective management of information technology can provide the return on investment needed to accomplish the goals and missions of the agencies within the resources available to state government.


## Interactive Video Network

The North Dakota Interactive Video Network (IVN) is a popular example of government efficiency. The network supports video applications in point-to-point and multi-point conferences. The IVN network connects 21 classrooms at the 11 North Dakota University System campuses with interactive video rooms at the five North Dakota Tribal Colleges, the state Capitol, the State Hospital, and 23 K-12 classrooms in the Great Western network.

Enhancements in this plan will increase the access to higher education opportunities throughout the state by supporting multi-point Internet Protocol (IP) video in combination with other video systems. The enhancements will also provide support for expanded use of video, especially Internet Video, for state government applications, K-12 schools, libraries, and county and city government for education, training seminars and meetings. Schools will be able to share teachers for selected classes, and all public agencies will save time and expense previously required to travel to a single meeting location.

The success of such programs is made possible through the implementation of state-of-the-art information technology.

## Geographic Information Systems

Another area for targeting efficiencies in technology is in Geographic Information Systems (GIS). Under leadership from the state's Chief Information Officer, the Convergent Group from Denver, Colorado, was selected to conduct an initial statewide GIS review.

The results indicated agency agreement that GIS is important to state government, that declining budgets make GIS a hard sell, that hiring and retaining GIS talent is difficult, that agencies would like to do more cost sharing, and that the GIS focus needs to be toward web-enabling GIS information. The review identified differences among the various agencies in data models, symbology, platforms, and accuracy.

According to the Convergent Group, GIS actions need to be focused by business case, and the business case must be tight and cannot be based solely on elimination of redundancy through cost sharing.

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## Criminal Justice Information

A number of planning activities currently underway by the Judicial Branch and the Attorney General's Office have underscored the need for an integrated system for collecting and reporting criminal justice information. The focus will be to provide better customer service through timely access to information.

Integration will also provide for greater efficiency by eliminating duplication and streamlining existing practices.

The Information Technology Department, with the cooperation of the Judicial Branch and Bureau of Criminal Investigation, has applied for planning assistance to SEARCH, the National Consortium for Justice Information and Statistics, and for a planning grant from the National Governors' Association (NGA). The activities required for the NGA grant will be integrated with the assistance provided by SEARCH. The integration will identify specific, high-priority initiatives to enhance information sharing.

## Electronic Document Management Systems

The idea of document management has been around for decades under such headings as the "paperless office" and "office automation."

The goal of document management has always been information sharing. The implementation of document management includes the capture and indexing of paper documents in a digital format. Once archived, they can be easily retrieved.

The technology is called Electronic Document Management Systems (EDMS). To make the technology available and affordable, the Information Technology Department intends to offer centralized EDMS services.

## Enterprise Resource Planning

Conducting business online will require the state to rethink policy and legislation regarding financial transactions.

To tie major administrative applications to a common environment, the state of North Dakota intends to build an Enterprise Resource Planning (ERP) system. The state seeks an integrated suite of software products with proven functionality for state government, higher education, and public education.

The core applications include financial management, purchasing, budgeting, human resources, payroll, asset management, and student information. Development is anticipated to span three years beginning just prior to the 2001-2003 biennium.

An element of the ERP system is a data warehouse: a copy of transaction data structured for querying and reporting. To deal efficiently with warehoused data, the state will acquire a system that includes a comprehensive ad hoc reporting and inquiry tool that allows users to easily create custom reports. The tool will operate in a web-centric environment, allow data warehouse data to be directly imported into documents created in third party products, and will be user-friendly.

The state of North Dakota intends to build an Enterprise Resource Planning System (ERP).

The state also desires the data warehouse to provide analytical applications in the areas of financial management, performance management, purchasing management, and workforce management. The applications should be easy to learn and use, completely web-enabled, be tightly integrated with the data warehouse, and have a look and feel similar to other system applications.

Furthermore, as part of the ERP, the state requires a comprehensive purchasing system to automate the entire procurement process, thereby improving the efficiency and effectiveness of state procurement. This process includes processing the requisition, preparing specifications, identifying potential suppliers, establishing evaluation criteria, drafting and issuing a bid solicitation.

It also requires receiving bids, evaluating responses, awarding a contract or issuing a purchase order, administering the contract, checking status, receiving the goods or services, processing payment, managing inventory and capitalized assets, and ensuring quality control at every stage in this process.

A system that addresses the procurement management needs of various levels of government and vendors desiring to do business with the state is planned.

Meeting the challenge of providing improved service and increased efficiencies in government will require that agencies work together cooperatively, minimize duplication of efforts, increase their sharing of common information technology resource, and foster innovation in the application and deployment of information technology.

To meet the new efficiency challenges of digital government, the state of North Dakota should:

- **Expand videoconferencing** - Expand the North Dakota Interactive Video Network and embrace Internet videoconferencing as a method of increasing employee collaboration while decreasing travel and location expenses.

- **Sponsor a GIS hub** - Sponsor a statewide Geographical Information System (GIS) hub that would provide a means of sharing the GIS information now stored locally at each agency.

- **Integrate Criminal Justice Systems** - Fervently proceed with plans to integrate the system for collecting and reporting criminal justice information to provide better customer service.

- **Coordinate EDMS** - Coordinate statewide efforts in electronic document management systems to promote larger sharing opportunities and common expertise.

- **Pursue ERP** - Pursue an Enterprise Resource Planning solution that will integrate the core financial and administrative applications of state government, higher education, and public education.

- **Build data warehouse support** - Acquire data warehousing and decision support tools that are fully integrated with the ERP system and other vital state management information systems to facilitate strategic planning, tactical operations, and system-wide analysis.

- **Implement e-procurement and expand PCards** - Automate and web-enable the entire process of procurement while expanding the use of procurement cards.

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# State government should be well managed.

Technological innovation and the speed of information are allowing society to do new things, and to do old things in new ways. As this different kind of society emerges, a different kind of government organization is needed, a government that uses technology as a vehicle for focusing on fast and expanded customer service. These changes call for innovations in leadership.

The Internet allows employees to participate remotely in leadership processes. And, there will be more employees available to do just that, because e-government allows for the automatic processing of routine business transactions around the clock. This frees human resources to exercise judgement and to participate to a greater degree in decision-making processes.

Knowledge workers must be encouraged to pursue opportunities in evolving leadership models.

In the digital world where the potential for collaborative work is so great, leadership among a few is no longer relevant. With this in mind, knowledge workers at all levels must be encouraged to participate in decision-making processes. The ERP and GIS systems will provide decision support information at a variety of levels.

A critical element in managing technology is the training and retention of a highly skilled workforce capable of developing and supporting the necessary infrastructure. The number of technology positions in North Dakota is expected to grow by over 90% by 2005. This tight market reflects the national statistics.

Students in the new certification program are taught to manage projects using a disciplined and consistent approach.

The high demand is driving up salaries and forcing employers to find new ways to attract and retain technology staff.

State government needs to adopt innovative methods used by private industry, such as signing bonuses and project completion bonuses. Contractors have been employed to supplement existing staff when vacancies have occurred; however, costs can be up to three times higher for contract staff versus using state employees. Education providers in the state will need to update curricula to produce the skills and number of qualified people required.


Consistent information technology project management was a major challenge set forth in the last biennium. To that end, a project management certification curriculum and training program was developed and implemented jointly by the Information Technology Department, Mayville State University and the Project Management Institute (PMI). The purpose of the state of North Dakota certification program is to build the capacity of state agencies to deliver successful technology projects. Students in the new certification program are taught to manage projects using a disciplined and consistent approach. To certify, a candidate must complete a one-semester course provided by Mayville State University and successfully pass the certification exam from PMI.

The project management certification program will serve as a model for other training efforts. Technology staff will continue to develop non-technical skills. Likewise, it is important that business managers and staff at all levels of an organization develop an understanding of technology.

To meet the evolving management needs of digital government, the state of North Dakota should:

- **Organize for e-government** - Reorganize government for efficiency, as simply implementing technology is not enough. The practice of business process re-engineering is a necessary element.

- **Recruit, Train and Retain** - Aggressively recruit technology workers who have the latest skills, insure that current technicians receive training to maintain and increase their skill levels, and establish programs aimed at meeting the professional requirements of skilled employees.

- **Train e-leaders** - Provide training that develops digital leadership skills based upon speed, flexibility and customer focus while upholding the theory of cascading leadership where everyone is a potential leader.

- **Promote project management certification** - Demand that all large information technology projects are managed by qualified project managers.

- **Prioritize at all levels** - Prioritize information technology resources at different levels, i.e. agency level, state level; to target the best use of limited dollars.

- **Reconstitute IT Advisory Committee** - Reconstitute the Statewide Wide Area Network Advisory Committee to allow representation on a statewide basis to provide a greater customer perspective. Change the purpose of the committee to act as a permanent "focus group" to provide feedback on technology planning issues.

- **Broaden research and planning** - Strengthen newly built technology-planning systems and broaden technology research that fosters sharing among agencies.

- **Create an innovation fund** - Create an innovation fund that allows agencies to take advantage of technological opportunities not foreseen during the budget planning cycle.

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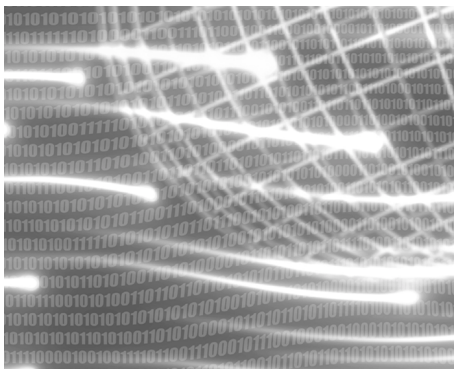

# State government should provide the leadership for developing a shared infrastructure.

On April 20, 1999, the 56th Legislative Assembly of the state of North Dakota passed Senate Bill 2043, modifying NDCC 54.59. That law requires each state agency and institution that desires access to wide area network services and each county, city, and school district that desires access to wide area network services to transmit voice, data, or video outside that county, city, or school district to obtain those services from the state Information Technology Department.

To address the requirement of the legislature and the needs of the state's citizens, the state issued a request for proposal (RFP) for outsourcing needed assistance. The state defined three major goals to be accomplished through that procurement process:

**3 Procurement Process Goals**

- **Integrate WAN** - To deploy an integrated statewide network to meet both current and future telecommunications requirements for government and education.
- **Postalize service** - To achieve statewide telecommunications rate reductions through postalized service offerings for government and education.
- **Increase broadband** - To promote economic development by increasing the availability of broadband services for residential and private business needs throughout all geographic areas of the state of North Dakota.

The state of North Dakota has viewed the slow deployment of new, wider bandwidth services as an area that it can help improve, not only for state and local government, but also ultimately for the citizens of North Dakota.

Leadership for Developing a Shared Infrastructure

By integrating the combined voice, data and video traffic from state and local government, education, and libraries in North Dakota into a single wide area network, it is believed that the state's telecommunications carriers will be encouraged to deploy an extended network of advanced services throughout the entire state.

With the implementation of the RFP, the statewide broadband telecommunication network is now growing. The state will spend about $3 million to roll out the network to initial 64 communities and 218 locations by the end of the year 2000.

When complete in 2001, the network will connect 552 locations in 194 cities. At that point, state analysts believe that the network will provide the greatest universal access to high-speed telecommunication services of any rural state in the nation.

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The statewide infrastructure project has three primary goals: to deploy an integrated network to meet current and future needs for government and education; to reduce telecommunication rates by aggregating public demand and negotiating lower price for bulk service; and to stimulate economic development by making broad band services available in every county and in communities throughout the state.

"Infrastructure, workforce training, economic development and tax and public policy — these are the four pillars that are essential to a successful statewide information technology strategy in this state," according to Curtis Wolfe, North Dakota's Chief Information Officer.

Public policy needs to support affordable, universal access to high-speed telecommunication services. Just as government programs supported telephones to rural areas, the state needs to drive programs and funding models that support Internet access to all of North Dakota.

Along that same vein, technology is an important key to economic development. Tax policy and assistance programs should be geared to this. In the process of moving forward, state policy makers must remember the "first, do no harm" statement. The state must not create barriers by over regulating but must remove existing barriers based on old models.

A third public policy area concerns the impact on financial and legal transactions that are moving from paper to electronic processes. Current legislation and policy needs to be evaluated and modified, if necessary, to fit the e-government model.

Workforce training is also essential to maximize the impact of the network infrastructure and to create economic development opportunities. The state network will get the wire to the door, but schools will need video equipment and computers to access the network. Curriculum will need to be updated and teachers will need to upgrade their skills to use the new technologies.

To achieve the primary goals of statewide infrastructure, indications imply that the state of North Dakota should be prepared to spend up to $20 million to:

- **Upgrade network** - Bolster the state's hard-wired information network.
- **Explore wireless** - Explore wireless and emerging technology infrastructure possibilities.
- **Train workforce** - Advance workforce training, especially in emerging technologies.
- **Expand e-government** - Expand the government's use of technology to deliver services and to improve in-state electronic commerce.
- **Enhance the state radio network** - Plan and implement current and evolving technologies to enhance the state radio network that serves public safety agencies.
- **Promote Public Policy** - Promote public policy to encourage universal access and economic development.

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## Conclusion

The planning process is an iterative one, improving and evolving as knowledge is gained from successes and mistakes. The state will see additional benefits as it moves toward a shared vision in the future as technology is used to improve customer service, improve the efficiency of state government, better manage scarce resources, and continue to build an infrastructure for information sharing.